

GREEN WOWTIGER
SMART ENERGY STORAGE

wowtiger

「User's Manual」



承认： 

物料编号：210110024

WOWTIGER TECHNOLOGY LIMITED
No.1, Yongyi Third Road, Yongxing Industrial Park, Henglan Town,
Zhongshan City, Guangdong Province
Website: <https://www.wowtiger.net>

Model : APOLO5K

Solar Energy System

Floor or wall mounted design

User's Manual



Model : APOLO5K

Preface

- This document mainly introduces the product information, installation wiring, configuration testing, troubleshooting, and maintenance content of the inverter. Please read this manual carefully before installing and using this product, understand product safety information, and familiarize yourself with its functions and features.
- Only applicable to professionals who are familiar with local regulations, standards, and electrical systems, have received professional training, and are familiar with the relevant knowledge of this product.
- Personnel responsible for installing and maintaining equipment must first undergo strict training, understand various safety precautions, and master the correct operating methods
- Only qualified professionals or trained personnel are allowed to install, operate, maintain, or replace equipment or components.

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1. Safety precautions

Please always follow the safety precautions information contained in this document when operating the equipment.

Notice

The inverter has been strictly designed in accordance with safety regulations and tested to be qualified. However, as an electrical equipment, relevant safety instructions must be followed before any operation is carried out on the equipment. Improper operation may result in serious injury or property damage.

1.1 General safety

- Due to product version upgrades or other reasons, the document content may be updated periodically. Without special agreements, the document content cannot replace the safety precautions in the product label or user manual. All descriptions in the document are for guidance only.
- Before installing the device, please read this document carefully to understand the product and precautions
- All equipment operations must be carried out by professional and qualified electrical technicians who are familiar with the relevant standards and safety regulations of the project location.
- When operating the inverter, it is necessary to use insulated tools and wear personal protective equipment to ensure personal safety. When contacting electronic devices, it is necessary to wear static gloves, static bracelets, anti-static clothing, etc. to protect the inverter from static damage.
- Equipment damage or personal injury caused by failure to install, use, or configure inverters according to document requirements is not within the responsibility of the equipment manufacturer.

1.2 Inverter safety



Warning

- It is recommended to add protective devices such as circuit breakers or fuses on the AC side of the inverter, and the specifications of the protective devices should be greater than 1.25 times the rated AC output current of the inverter.
- The protective grounding wire of the inverter must be firmly connected. When multiple inverters are used, ensure that the protective grounding points of all inverter chassis shells are equipotential connected.

2. Product introduction

2.1 Product overview and features

This machine is a new type of hybrid solar energy storage inverter control integrated machine that integrates solar energy storage, municipal charging and energy storage, and AC sine wave output. It adopts DSP control and advanced control algorithms, with high response speed, high reliability, and high industrial standards. There are four charging modes available: solar only, mains power priority, solar priority, and mains power & solar: inverter and mains power output options to meet different application needs.

The solar charging module adopts the latest optimized MPPT tracking technology, which can quickly track the maximum power point of the Photovoltaic system in any environment, and obtain the maximum energy of the solar panel in real time.

The AC-DC charging module adopts advanced control algorithms to achieve fully digital voltage and current dual closed-loop control, with high control accuracy and small volume. The AC voltage input range is wide, and the input/output protection function is complete, achieving stable and reliable charging and protection of the battery.

The DC-AC inverter module is based on fully digital intelligent design and adopts advanced SPWM technology to output pure sine waves, converting direct current into alternating current. It is suitable for AC loads such as household appliances, electric tools, industrial equipment, electronic audio and video, etc. The product adopts a high-resolution touch screen display design, which real-time displays the system's operating data and status. Comprehensive electronic protection functions ensure that the entire system is safer and more stable.

Features:

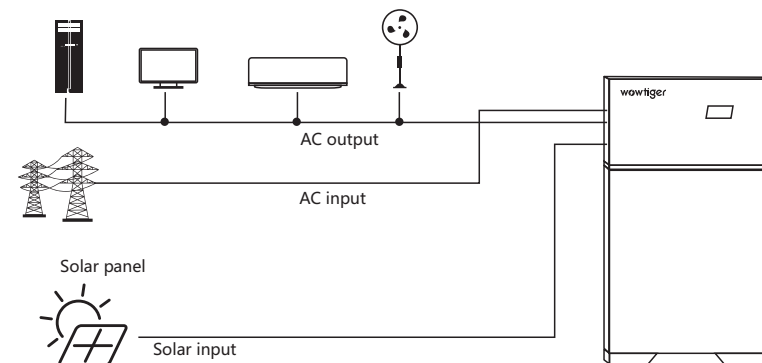
1. Adopting fully digital voltage and current dual closed-loop control, advanced SPWM technology, output pure sine wave.
2. It has two output modes: mains power bypass and inverter output, and has the function of uninterrupted power supply.
3. There are four charging modes to choose from: solar only, mains power priority, solar priority, and hybrid charging.
4. Advanced MPPT technology with tracking efficiency of up to 99.9%
5. High resolution touch screen design, dynamically displaying system data and operating status.
6. The ON/OFF circular self-locking switch controls AC output.
7. Equipped with power saving mode function, reducing no-load losses.

8. It adopts intelligent adjustable speed fan, efficient heat dissipation and prolong system life.
9. Equipped with lithium battery solar and mains activation functions, supporting lithium battery access.
10. It has multiple protection functions and 360 ° all-round protection.
11. Equipped with complete short circuit protection, overvoltage and undervoltage protection, overload protection, and backflow protection.

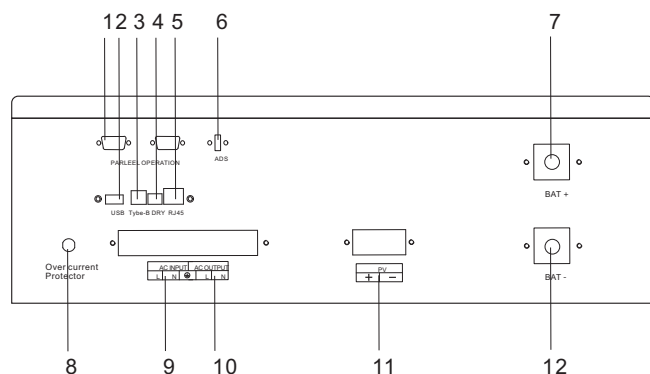
2.2 Basic system introduction

The following figure shows the system application scenario of this product. A complete system includes the following parts:

1. Photovoltaic modules: convert light energy into direct current, charge the battery through an integrated machine, or directly convert it into alternating current to supply power to the load.
2. Mains power or generator: Connected to the AC input terminal, it can supply power to the load and also charge the lithium battery. If there is no connection to the mains or generator, the system can still operate normally, and the load power is provided by the battery and photovoltaic modules.
3. Lithium battery: The function of a lithium battery is to ensure the normal power consumption of the system load when solar energy is insufficient and there is no electricity available.
4. Household load: It can be connected to various household and office loads, including refrigerators, lamps, TV sets, fans, air conditioners and other AC loads.
5. Inverter control all-in-one machine: the energy conversion device of the whole system.
6. The specific system wiring method is determined by the actual application scenario.



2.3 Appearance description



No.	Parts
1	Parallel communication interface
2	WiFi/GPRS communication port
3	TYBE-B communication port
4	Dry contact
5	BMS communication port (supports CAN/RS485 protocol)
6	Parallel dialing switch
7	Battery positive electrode
8	Overcurrent protector
9	AC input
10	AC output
11	Photovoltaic input
12	Battery negative electrode

3. Installation instructions

3.1 Installation precautions

Before installation, please read this manual carefully to familiarize yourself with the installation steps.

➤ The equipment should not be installed in flammable, explosive, or corrosive environments. The installation position should avoid the range that children can reach and avoid being installed in easily touched positions. There may be high temperatures on the surface of the equipment during operation to prevent burns. The installation space must meet the requirements for ventilation and heat dissipation of the equipment and the operating space.

➤ The inverter should be installed in an environment away from sunlight, rain, snow, etc. It is recommended to install it in a sheltered installation location. If necessary, a sunshade can be built.

➤ The equipment protection level meets the requirements for indoor and outdoor installation, and the installation environment temperature and humidity must be within a suitable range.

➤ The installation position of the equipment should be easy to operate and maintain, ensuring that the equipment indicator lights, all labels are easy to view, and the wiring terminals are easy to operate.

➤ After the power switch is turned off, there is still high voltage inside the equipment. Do not open or touch the internal components. After the capacitor is discharged, carry out relevant operations.

➤ It is forbidden to reverse the polarity of the battery input terminal of this product, otherwise it will easily damage the equipment or cause unpredictable danger.

➤ The mains power input and AC output are high-voltage, please do not touch the wiring.

➤ When the fan is working, do not touch it to prevent injury.

➤ For the input power supply of the load equipment, it is necessary to confirm that this all-in-one machine is the only input device, and it is forbidden to use it in parallel with other input AC power sources to avoid damage.

3.2 Equipment handling

Caution

- When carrying out transportation, turnover, installation and other operations, it is necessary to comply with the laws, regulations, and relevant standards of the country and region where it is located.
- Before installation, the inverter needs to be transported to the installation location. To avoid personal injury or equipment damage during the transportation process, please pay attention to the following:
 1. Please equip corresponding personnel according to the weight of the equipment to prevent it from exceeding the weight range that can be carried by the human body and injuring personnel.
 2. Please wear safety gloves to avoid injury.
 3. Please ensure that the equipment is balanced during transportation to avoid falling.

3.3 Electrical connections

Danger

- All operations, cables, and component specifications used during the electrical connection process must comply with local laws and regulations.
- Before making electrical connections, please disconnect the DC switch and AC output switch of the inverter to ensure that the equipment has been powered off. It is strictly prohibited to operate with electricity, otherwise there may be dangers such as electric shock.
- Similar cables should be bundled together and arranged separately from different types of cables, and intertwining or cross arrangement is prohibited.
- If the cable bears too much tension, it may cause poor wiring. When wiring, please reserve a certain length of the cable before connecting it to the inverter wiring port.
- When crimping the wiring terminal, please ensure that the conductor part of the cable is in full contact with the wiring terminal. Do not crimp the cable insulation with the wiring terminal together, otherwise it may cause the equipment to be unable to operate or cause damage to the inverter terminal strip due to unreliable connection and heating after operation.

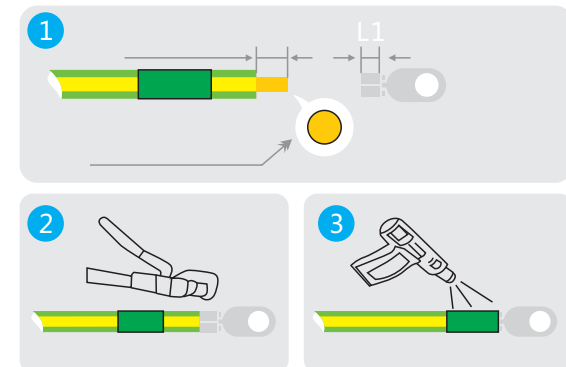
Notice

- When making electrical connections, please wear personal protective equipment such as safety shoes, protective gloves, insulated gloves, etc. as required.
- Only professional personnel are allowed to carry out electrical connection related operations.
- The cable colors in the graphics in this article are for reference only, and the specific cable specifications must comply with local regulatory requirements.

3.4 Connecting the protective ground wire

Warning

- The protective grounding of the chassis casing cannot replace the protective grounding wire of the AC output port. When wiring, ensure that the two protective grounding wires are reliably connected.
- When multiple inverters are used, ensure that the protective grounding points of all inverter chassis shells are equipotentially connected.
- To improve the corrosion resistance of terminals, it is recommended to apply silicone or paint on the outside of the grounding terminal for protection after the installation of the protective ground wire connection.
- Please provide your own protective grounding wire, recommended specifications:
 - Type: Outdoor single core copper wire
 - Conductor cross-sectional area: 4-6 mm²

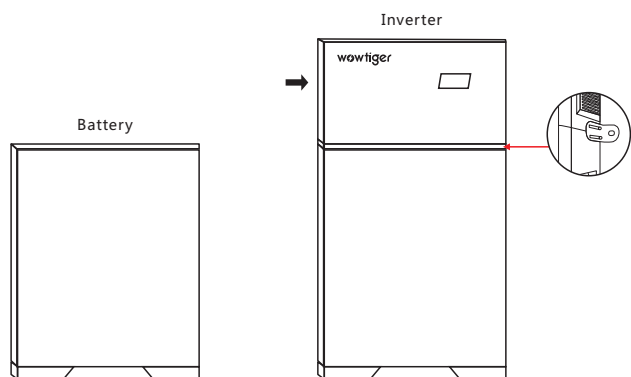


3.5 Single machine installation and wiring

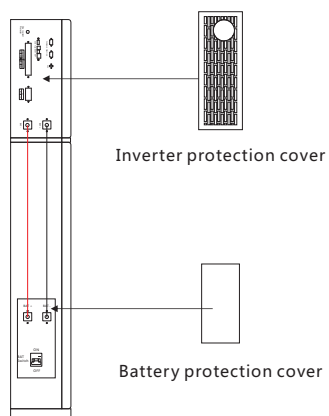
Step 1: ① The product is installed on the flat ground and against the wall. After the installation position is determined, please ensure that there is a space of more than 300mm between the left and right air outlets to ensure Natural convection heat dissipation. Please refer to the installation diagram above.

② Prioritize moving the battery to its position and placing it in place, then stack the inverter, as shown in the following figure;

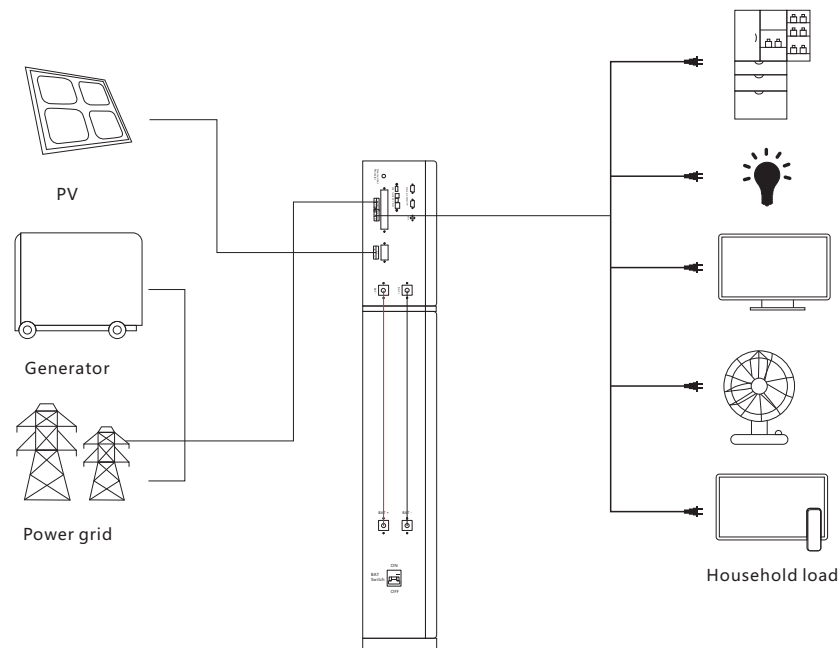
③ After stacking the inverter and battery, please remove the L fixing bracket from the inverter and battery to prevent the product from falling;



Step 2: Remove the terminal protection cover.

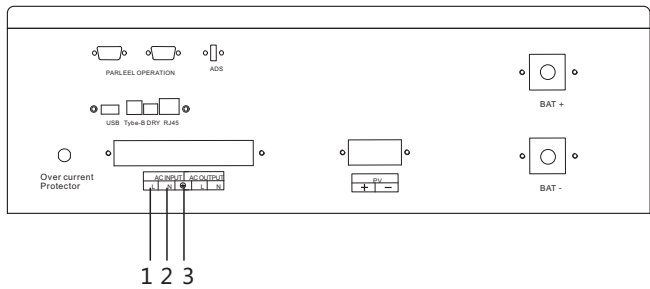


Step 3: Wiring



AC input wiring

- ① Before AC input wiring, disconnect the external circuit breaker and confirm that the current carrying capacity of the cable meets the requirements.
- ② According to the cable sequence and terminal positions shown in the following figure, correctly connect the AC input line. Please first connect the ground wire, then the live wire and zero wire.

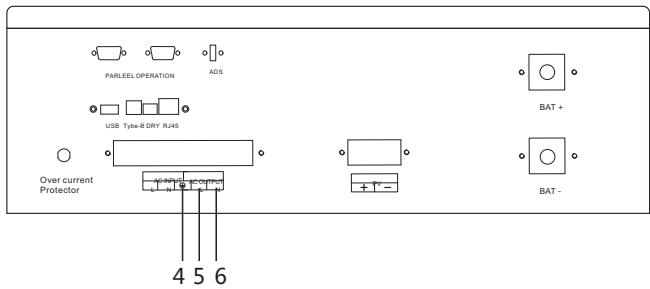


AC Input Wiring Diagram

No.	AC INPUT	Cable
1	L	
2	N	
3	PE 	
Suggest using cables 4-6 mm ²		

AC output wiring

- ① Before AC output wiring, disconnect the external circuit breaker and confirm that the current carrying capacity of the cable meets the requirements.
- ② According to the cable sequence and terminal positions shown in the following figure, correctly connect the AC input line. Please first connect the ground wire, then the live wire and zero wire.



AC OUTPUT wiring diagram

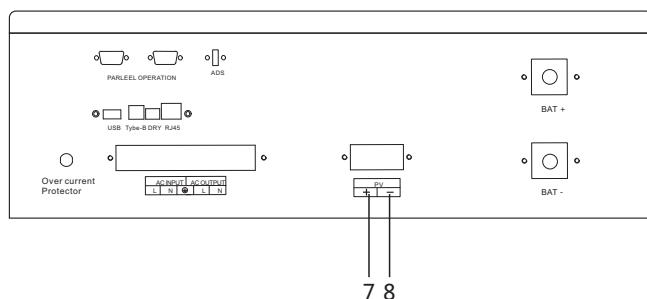
No.	AC OUTPUT	Cable
4	PE 	
5	L	
6	N	
Suggest using cables 4-6 mm ²		

⚠ Warning

- When wiring, the AC line and the "L", "N", and "PE" ports of the AC terminal are completely matched. If the cable connection is incorrect, it will cause equipment damage.
- Please ensure that the wire core is fully inserted into the terminal wiring hole and not exposed.
- Ensure that the cable connections are tight, otherwise the operation of the equipment may cause overheating of the wiring terminals and damage to the equipment.

The wiring method of PV input:

- ① Before wiring, disconnect the external circuit breaker and confirm that the current carrying capacity of the cable used meets the requirements.
- ② Connect the PV input cable correctly according to the cable sequence and terminal position shown in the figure below.



PV input wiring diagram

No.	PV	Cable
7	PV输入 "+"	
8	PV输入 "-"	
Suggest using cables 4-6 mm ²		

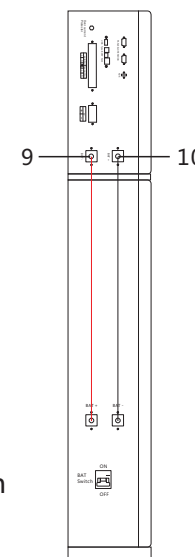
⚠ Danger

- Please ensure that the maximum open circuit voltage of each photovoltaic circuit is within the allowable range of the inverter.
- Before connecting the PV string to the inverter, please confirm the following information, otherwise it may cause permanent damage to the inverter, and in severe cases, it may cause fire and cause personal and property damage.
 1. Please ensure that the maximum short-circuit current and maximum input voltage of each MPPT are within the allowable range of the inverter
 2. Please ensure that the positive pole of the PV string is connected to the PV+ of the inverter, and the negative pole of the PV string is connected to the PV- of the inverter.

BAT wiring method:

- ① Before wiring, please check that the battery circuit breaker is in a closed state and connect the wires in the closed state;
- ② Please use factory matched connectors and wires for the battery connection line (including connectors). Please refer to the packaging attachment for details;
- ② Connect the BAT cable correctly according to the cable sequence and terminal position shown in the figure below.

BAT +: positive electrode of battery
BAT -: negative electrode



Battery Input Wiring Diagram

No.	BAT	Cable
9	BAT input "+"	
10	BAT input "-"	

Danger

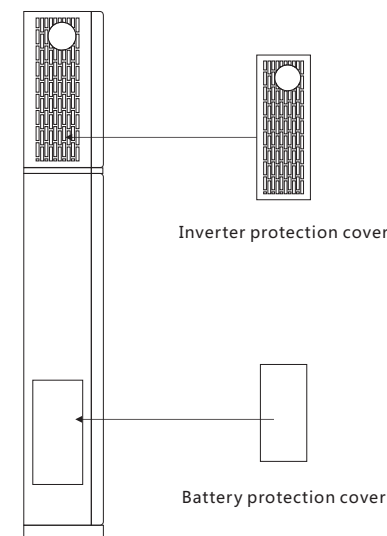
- Short circuit of the battery may cause personal injury, and the instantaneous high current caused by the short circuit can release a large amount of energy, which may cause a fire.
- Before connecting the battery cable, please confirm that the inverter and battery have been powered off, and that the front and rear switches of the equipment have been disconnected.
- When the inverter is running, it is prohibited to connect or disconnect the battery cables. Violation of regulations may lead to electric shock hazards.
- Prohibit connecting loads between inverters and batteries.
- When connecting the battery cable, please correctly match the color of the wire and insert the positive and negative poles to prevent accidental electric shock or short circuit of the battery.

Warning

- When wiring, the battery cable should match the "BAT+", "BAT -", and grounding port of the battery terminal completely. If the cable connection is incorrect, it will cause equipment damage
- Ensure that the plug is securely inserted into the slot without looseness, otherwise the equipment may overheat the wiring terminals and cause equipment damage during operation.

Step 4: Check if the wiring is connected correctly and firmly, especially check if the positive and negative connections of the battery input are reversed, whether the positive and negative connections of the PV input are reversed, and whether the AC input is incorrectly connected to the AC output terminal.

Step 5: Install Terminal Protection Cover



Step 6: Start the all-in-one machine First, close the circuit breaker at the battery end, then press the round switch at the bottom right of the inverter to "ON" status, close the circuit breakers of the photovoltaic system and the mains again, and finally open the AC loads one by one after the AC output is normal, so as to avoid the protection action caused by large transient impact caused by simultaneously opening the load, and the all-in-one machine operates normally according to the setting mode.



Attention: If supplying power to different AC loads, it is recommended to first turn on the load with high impact current and wait for the load to stabilize before turning on the load with low impact current.

4. Operating mode

4.1 Charging mode

1. Photovoltaic priority: Photovoltaic priority charging, only when the photovoltaic fails, can the mains charging be activated. By fully utilizing solar energy for power generation during the day and switching to city electricity for charging at night, the battery capacity can be maintained and used in areas with relatively stable power grids and high electricity prices.
2. Mains power priority: mains power gives priority to charging batteries, and only starts photovoltaic charging when mains power is ineffective.
3. Hybrid charging: Hybrid charging of photovoltaic and municipal electricity, with priority given to photovoltaic charging. When photovoltaic energy is insufficient, municipal electricity is supplemented. When the photovoltaic energy is sufficient, the mains power stops charging. This method of charging is the fastest and suitable for areas with unstable power grids, providing sufficient backup power supply at any time.
4. Photovoltaic charging only: Photovoltaic charging only, without starting mains power charging. This method is the most energy-saving method, and the battery energy comes from solar energy, usually used in areas with good lighting conditions.

4.2 Power supply mode

➤ Photovoltaic priority mode:

When the photovoltaic system is ineffective, switch to mains power supply and charging. This mode maximizes the utilization of solar energy while maintaining battery power, making it suitable for areas with relatively stable power grids.

The priority of the power supply sequence achieved is: photovoltaic - mains - battery.

➤ Mains power priority mode:

Only switch to battery inverter power supply when there is no mains power, and switch to mains charging and power supply when there is mains power. The equipment is equivalent to a backup UPS, used in areas with unstable power grids. Switching does not affect photovoltaic charging. **The priority of the power supply sequence achieved is: mains - photovoltaic - battery.**

➤ Inverter priority mode:

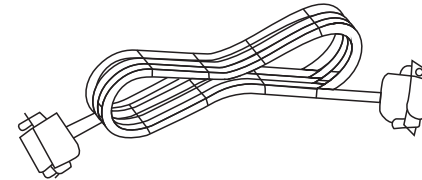
Switch to mains power only when the battery voltage is below the set point, and switch to battery discharge mode when the mains charging battery voltage is above the set point, cycling battery charging and discharging. This mode maximizes the use of direct current energy for stable areas of the power grid. Switching does not affect photovoltaic charging. (Priority power supply order of photovoltaic battery municipal power). **The priority of the power supply sequence achieved is: photovoltaic battery municipal power.**

5. Parallel operation

5.1 Precautions for parallel operation

1. This system is a wall mounted integrated system. Due to height and wiring limitations, a maximum of 2 inverters can be connected in parallel. It is recommended not to use them in parallel for ease of installation.
2. When using the in-parallel function, it is necessary to connect the in-parallel communication cable correctly, stably and reliably. The following is the connection cable diagram (packaging accessories):

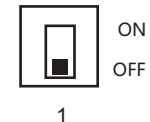
Parallel communication cable * 1 (optional):



5.2 Parallel ADS dialing position setting

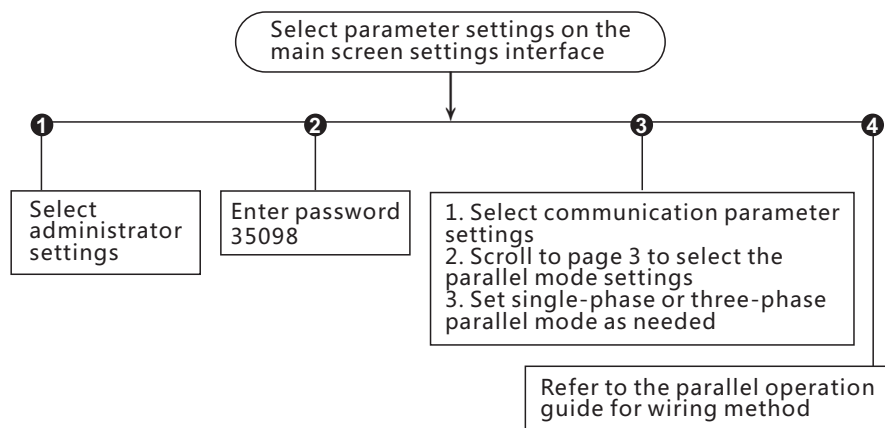
If parallel operation occurs in the system, please select the second ADS to dial the code to ON.

The dialing code is shown in the figure:



The machine defaults to the OFF state.

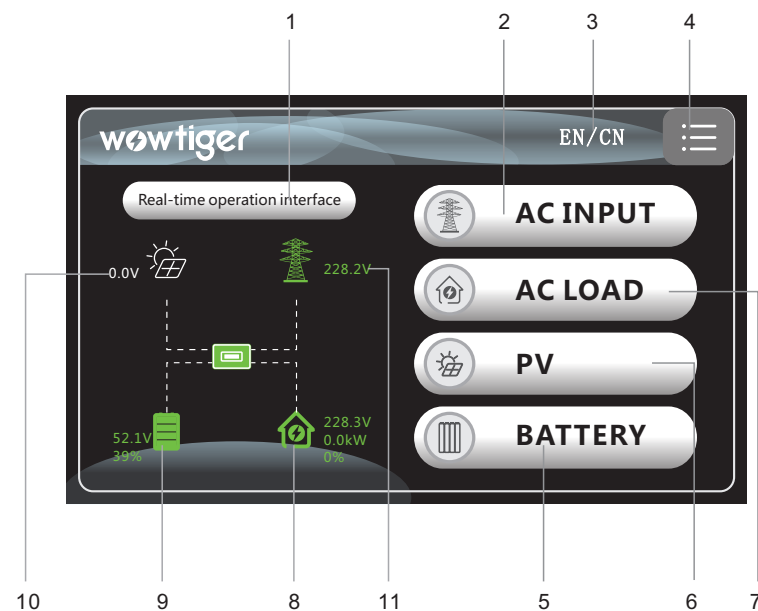
5.3 Touch screen parallel settings are shown in the following figure



5.4 Notes on parallel operation

Attention: When customers choose to merge inverters, each inverter must be connected to a separate solar panel and cannot be connected to a single PV, otherwise the inverter may be burned out!!!

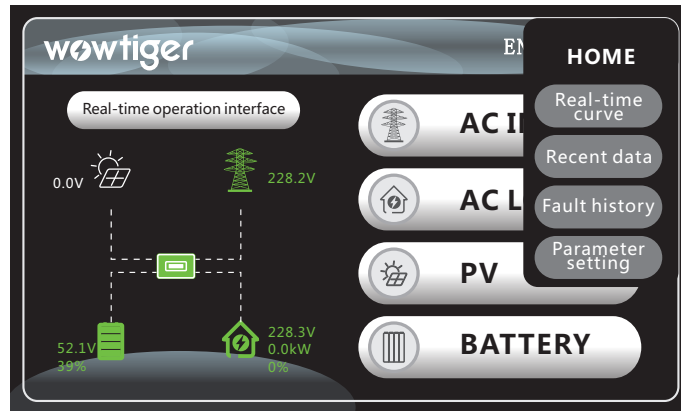
6. Touch screen interface description



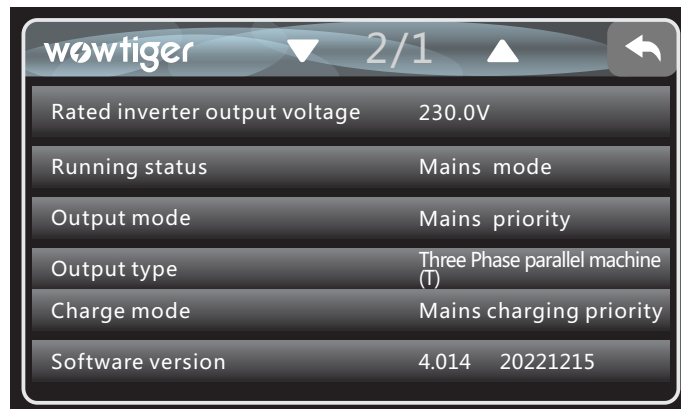
No.	Function description	No.	Function description
1	Real time operation interface	7	AC load
2	AC input	8	Real time load information
3	Switching between Chinese and English	9	Real time battery information
4	Enter the settings interface	10	Real time photovoltaic information
5	Battery pack	11	Real time input information
6	PV		

6.1 Page display introduction

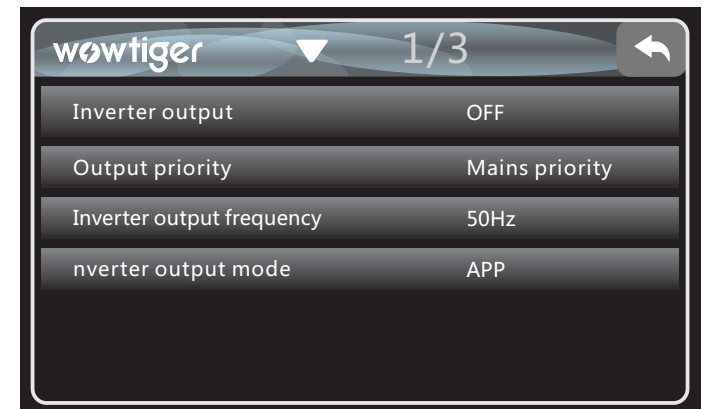
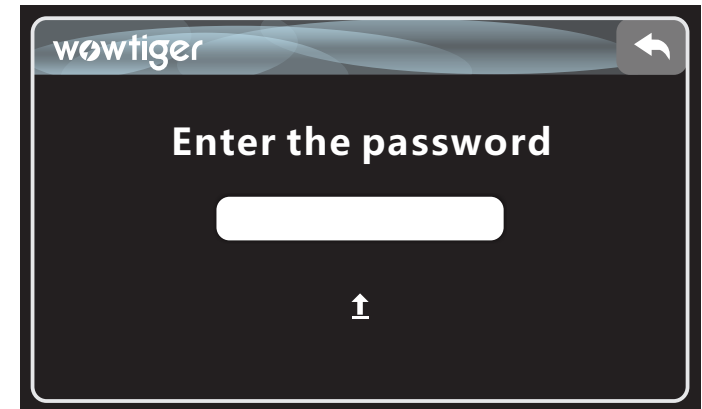
6.1.1 Main interface display



6.1.2 Real time data information

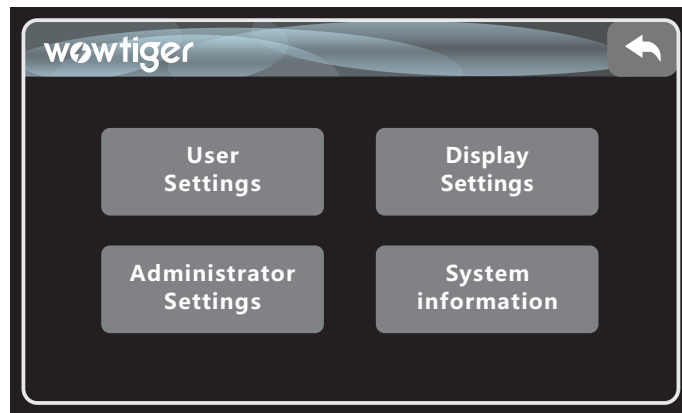


6.1.3 User setting



User set password: 6666

6.1.4 Administrator settings



Administrator set password: 35098

6.1.5 Parameter setting

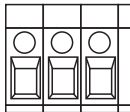
No.	Parameter name	Option setting	Description
1	Inverter output voltage	230v	208, 220, 230, 240V selectable, default 230V
2	Output frequency	50Hz	50/60Hz, default 50Hz
3	Output priority	Mains power output priority	Mains power output priority, photovoltaic output priority, photovoltaic battery mains power output priority, default to mains power output priority
4	Inverter output mode	APP	APP (for household appliances), UPS (for computers and other devices), default APP.
5	Charging priority	PNG (hybrid charging mode, i.e. photovoltaic + mains power)	PNG (default), OPV (only photovoltaic charging), GRD (mains power charging priority), PV (photovoltaic charging priority)
6	Maximum current	30A	2-80A optional
7	Mains power charging current	30A	2-80A optional
8	Battery type	Lithium battery	The default setting is AGM (lead-acid battery); The second type is FLD (water filled battery); The third type is LIB (lithium battery); The fourth type is CUS (user defined type)
9	Power saving mode	OFF (default)	It can be set in single machine operation mode, with the default setting being OFF and the function not turned on. When set to ON, in battery mode, if the load is below 25W, the system will briefly stop before continuing to output. If the load exceeds 35W, the system will resume continuous normal output.
10	Parallel operation mode setting	Stand-alone machine	Single machine mode (default), single-phase parallel operation mode, 3-phase parallel operation (R-phase), 3-phase parallel operation (S-phase), 3-phase parallel operation (T-phase) mode. Please refer to the parallel operation guide for specific parallel operations.
11	B MS communication settings	OFF	By default, when set to ON in lithium battery mode, the SOC of the battery module can be viewed.
12	Float charging voltage	55.2V	It cannot be set when the battery definition mode is AG M (lead-acid battery type) or FLD (water filled battery type).The default setting is 55.2V, and the adjustable range is [50-58]. The voltage at the constant voltage point shall be greater than that at the floating charge point.

No.	Parameter name	Option setting	Description
13	Battery shutdown point	42V	It cannot be set when the battery definition mode is AGM (lead-acid battery type) or FLD (water filled battery type). The initial default setting is 42V. When the battery type is set to CUS (customer set type), the battery shutdown point can be modified. When the battery type is set to LIB (lithium battery type), the battery shutdown point can be modified.
14	Battery low voltage point	47.6V	When the battery definition mode is AGM (lead-acid battery type) or FLD (water filled battery type), it cannot be set. The default setting is 47.6V. When the battery type is set to CUS (customer set type), the low voltage point of the battery can be modified. When the battery type is set to LIB (lithium battery type), the low voltage point of the battery can be modified.
15	Battery back to mains supply voltage point	46V	When both battery and mains power exist, when the battery is discharged to a certain voltage, it will switch to mains power to ensure that the battery will not empty. All states can be set with output priority to be set in PV and PBG modes, with a default setting of 46V.
16	Balanced charging	OFF	The default setting is OFF, and the function is not enabled; if it's set to ON, the controller will start to enter the equalization phase when the floating charge phase reaches the set equalization interval (battery equalization cycle), or when equalization is activated immediately.
17	Equalizing opening voltage	58.4V	All modes can be set, with a default setting of 58.4 and a setting range of [48~60]
18	Equalizing charging time	60min	All states can be set, and during the equalization phase, the controller will charge the battery as much as possible until the battery voltage rises to the battery equalization voltage. Then, constant voltage regulation is used to maintain the battery voltage and balance the battery voltage. The battery will remain in the equalization phase until the set battery equalization time is reached. The default setting is 60 minutes, and the range can be set to [5-900], with each set increment of 5 minutes.
19	Equalization charging delay	120min	All states can be set. In the equalization stage, when the battery equalization time expires and the battery voltage does not rise to the battery equalization voltage point, the charging controller will extend the battery equalization time until the battery voltage reaches the battery equalization voltage. When the battery equalization delay setting ends and the battery voltage is still lower than the battery equalization voltage, the charging controller will stop equalization and return to the floating charging stage. The default setting is 120 minutes, with a settable range of [5-3900] and increments of 5 minutes each time.

No.	Parameter name	Option setting	Description
20	Equalizing charging interval	30day	When the battery access is detected in the floating charge stage when the equalization mode is turned on, the controller will start to enter the equalization stage when the set equalization interval (battery equalization cycle) is reached. The default setting is 30 days, and the range can be set to [1-90], with increments of 1 day each time.
21	Immediately equalize charging	OFF	All states can be set, with the default setting being OFF and the function not turned on; When set to ON and in the float charging stage when the equalization mode is turned on and battery connection is detected, equalization charging is immediately activated, and the controller will begin to enter the equalization stage.
22	Charging cut-off voltage	56.4V	All states can be set. 1: When the battery definition mode is AGM (lead-acid battery type) or FLD (water filled battery type), it cannot be set. The initial default settings are 56.4V (AGM) and 58V (FLD) 2: When the battery type is set to CUS (customer set type), the constant voltage charging point can be modified, and the range can be set to [48,60].The voltage at the constant voltage point shall be greater than that at the floating charge point. 3: When the battery type is set to LIB (lithium battery type), the constant voltage charging point can be modified, with a default setting of 56.4 and a settable range of [48,60].The voltage at the constant voltage point shall be greater than that at the floating charge point.
23	Charging mode	Auto mode	Automatic mode, 2-stage charging, 3-stage charging
24	Battery not connected alarm	OFF	All states can be set, with the default setting being OFF. When it is set to OFF, when the battery is disconnected, there will be no alarm of battery disconnection, battery low voltage, or battery undervoltage. It can be set in single machine operation mode, but cannot be set for other models.
25	Back to battery mode voltage point	52V	1: The initial default setting is 52V, and when set to FUL, the battery will charge until fully charged before restarting in battery mode. 2: When the battery is in CUS (customer set type) mode and the output priority is set to PV priority output or PBG output, if it is not in battery mode and the battery voltage is higher than TCFV-1V, the system will switch back to battery mode. The range can be set to [48~58], 3: When the battery definition mode is AGM (lead-acid battery type) or FLD (water filled battery type), the default setting is 52V, and the range can be set to [48~58]. 4: When the battery definition mode is UB (lithium battery type) mode, the default setting is 54.4V, and the range can be set to [46~58]

No.	Parameter name	Option setting	Description
26	Overload automatic restart	ON	All states can be set to overload and restart. The default setting is ON.
27	Over temperature automatic restart	ON	All states can be set to overheat and restart. The default setting is ON.
28	Overload to bypass	OFF	All states can be set, with the default setting being OFF and the function not turned on; When set to ON, in the case of PV priority output with load, if overloaded, the system will immediately switch to bypass (mains output, also known as bypass mode).
29	Mains supply high voltage point setting	264V	The inverter is in APP mode and all states can be set. In inverter mode (output mode: MOD needs to be set to APP), the high voltage point of the mains power is set, with a default setting of 264V and a settable range of [264~280].
30	Mains supply low voltage point setting	154V	The inverter is in APP and UPS modes, and all states can be set. In inverter mode (output mode: MOD needs to be set to APP), the low voltage point of the mains power is set, with a default setting of 154V and a settable range of [90~154]. (Output mode: MOD needs to be set to UPS), set the low voltage point of the mains power, with a default setting of 185V and a settable range of [170~200].
31	Restore default	OFF	Settings can be made in mains mode and standby mode (StandBy: no output but on screen state). It cannot be set in battery mode. Before setting, this interface is displayed as OFF. When it is set to ON, the system will restore the default setting. After setting, this interface will display OFF again. The mains power and standby modes can be set and take effect immediately, but cannot be set in battery mode.
32	Main input power failure alarm	ON	The alarm for loss of mains power or PV will sound for a long time. All states can be set to ON by default, and the alarm for loss of mains power or PV will sound for a period of time. It can be set to OFF. (All modes can be set) The default setting is ON. After the main input detection is lost, the buzzer will beep continuously for 3 seconds; When set to OFF, the buzzer will not sound frequently after the main input is lost.

7. Dry contact function

Machine status	Conditions			Dry contact port :	
				 NC C NO	
Switch off	When the machine is in a shutdown or standby state			NC&C	NO&C
Switch on	The output is supplied by mains power			Close	OPEN
	The output is powered by batteries or photo voltaics	Set output priority to mains priority	Battery voltage < set battery low voltage point	OPEN	Close
			The battery voltage is greater than the set value of BTB or the battery enters float charging mode	Close	OPEN
		Set the output priority to PBG or PV priority	Battery voltage < BTG set value	OPEN	Close
			The battery voltage is greater than the set value of BTB or the battery enters float charging mode	Close	OPEN

- Notes: BTB means back to battery mode voltage point (BTB)
- BTG means battery back to mains supply voltage point
- PBG is an output mode that prioritizes the power supply of photovoltaic cells in order of priority

8. Whole machine protection function

	Protection function	System behavior
Input	Low voltage abnormal protection for mains supply	System switching to battery operation in mains mode
	High voltage protection for mains supply	System switching to battery operation in mains mode
Battery	Battery low voltage protection	MCU performs shutdown processing based on low voltage points under different loads
	Battery high-voltage protection	Switch to failure mode
PV	Photovoltaic high-voltage protection	Fault mode
	Photovoltaic low-voltage protection	Stop photovoltaic output
Output	over load protection	Switch to fault mode for operation in battery mode, wait for load < 75% to start and switch back to inverter mode for operation
	Output short-circuit protection	Battery mode cutoff output The mains mode is controlled by the breaker @ Line cut-off protection
	Output low voltage protection	Switching from mains power mode to fault mode Switching to fault path mode in battery mode
	Output high-voltage protection	Switching from mains power mode to fault mode Switching from battery mode to fault mode

9. Fault description

Fault	Fault description
1	Line boost soft start failure
2	Bus overvoltage
3	Bus undervoltage
4	Battery overcurrent
5	Over Temperature
6	Battery overvoltage
7	Bus soft start fault
8	Bus short circuit
9	Inverter soft start fault
10	Inverter output overvoltage
11	Inverter output undervoltage
12	Inverter short circuit
13	Negative power protection
14	Overload fault
15	Model malfunction
16	No bootstrap program
17	PV program burning
19	Same serial number
20	CAN communication error
21	Excessive battery pressure difference
22	Excessive input voltage difference
23	Input voltage frequency difference
24	Asynchronous setting of output parameters
25	Output out of step
26	BMS fault

10. Alarm description

Alarm code	Alarm description
50	Battery not connected
51	Battery low voltage shutdown
52	Battery Low
53	Charger shortcircuit
54	Low power discharge
55	Battery overcharge
56	BMS loss
57	Over Temperature
58	Fan failure
59	EEPROM fault
60	Overload
61	Abnormal generator waveform
62	PV energy weak
63	Sync loss
64	Incompatible parallel settings
65	Incompatible parallel version
66	Parallel communication failure
67	Differences in parallel power supply
68	Low SOC shutdown
69	Low SOC

11. System maintenance

11.1 Power down of inverter

Danger

- When operating and maintaining the inverter, please turn it off. Operating the equipment with power may cause damage to the inverter or result in electric shock hazards.
- After the inverter is powered off, it will take a certain amount of time for internal components to discharge. Please wait until the equipment is fully discharged according to the required label time requirements.

Step 1: Disconnect the inverter AC Input AC circuit breaker.

Step 2: Disconnect the inverter AC Output AC circuit breaker.

Step 3: Disconnect the energy storage circuit breaker between the inverter and the battery.

Warning

- Ensure that the inverter is powered off.
- When operating the inverter, please wear personal protective equipment.

Maintenance content	Maintenance methods	Maintenance cycle
System cleaning	Check if there are any foreign objects or dust in the heat sink and air inlet/outlet.	Once/half a year~1/- year
DC switch	Turn the DC switch on and off continuously for 10 times to ensure its normal function.	Once/--year
Electrical connections	Check for loose electrical connections, damaged cable appearance, and copper leakage.	Once/half a year~1/- year

12. Technical parameters

Model	APOLO5K	
Battery capacity	10240WH	
Battery voltage	51.2V	
Parallel Connect	Max Parallel Connection Allowed	2
Utility Mode	Input Voltage	170~280Vac
	Frequency	40~70Hz , Default
	Overload/short circuit protection	The bypass circuit breaker (40 A)
	Maximum efficiency	0.995
	Conversion time(bypass and inverter)	< 10mS
	Biggest bypass overload current	40A
Inverter Mode	Output voltage waveform	Pure sine wave
	Rated output power (W)	5000W
	Power factor	1PF
	Rated output voltage (Vac)	208/220/230/240 Vac(Settable) Default 230V
	Output frequency range (Hz)	50.0 / 60.0 Hz (Settable) Default 50 Hz
	Maximum efficiency	> 94.5%
	Overload Capacity	1min@102%~110% Load 10s@110%~130% Load 3s@130%~150% Load 0.2s@>150% Load
	Battery voltage	51.2V
	Compatible battery type	Lead-acid/lithium electricity
Utility Charging	Maximum charging current(can be set)	80A

PV/Battery Charging	Type of controller (PV)	MPPT
	Largest PV open circuit voltage	500V
	PV operating voltage range	120-430V
	Largest PV input current	18A
	Largest PV power input	5500W
	Solar charging current range (can be set)	2~80A
Biggest mixed charging current (PV+ AC)	The biggest mixed charging current (can be set)	80A
Specifications	Protection functions	Over-voltage and low-voltage protection, overload protection, short-circuit protection and over-temperature protection of lithium batteries
	Working temperature range	-10°C-50°C
	Storage temperature range	-15~60°C
	Humidity range	20%~95% (No condensing)
	Noise Level	≤50db
	Heat dissipation	forced air cooling
	Display mode	HD touch screen
	Monitoring method (optional)	WiFi/ 4G
	Product size (L*W*H) mm	Battery : 671*x469x132 Inverter : 243*474*132
	Packing size(L*W*H) mm	Battery : 735*575*200 Inverter : 535*355*158
	Net weight(kg)	Battery : 70 Inverter : 10.6
	Gross weight(kg)	Battery : 79.5 Inverter : 12

12.1 Packing list

No.	Name	Quantity/unit	Remarks
1	Host of the all-in-one machine	1	
2	User's Manual	1	
3	Accessory kit	1	

12.2 Product after-sales guide

Product warranty card	
Customer name	
Product model	
Purchase date	
Address	
Contact number	

Cut along the dotted line 

The customer should keep this warranty card properly as a maintenance certificate.

- ⦿ This product is guaranteed for 24 months from the date of purchase.
- ⦿ If the product is used under normal conditions during the warranty period, the warranty card and invoice can be presented according to the warranty terms, and our company will provide guaranteed after-sales service. If the damage to the product is caused by the following reasons, our company will not be obligated to provide warranty services.

The following cases are not covered by the warranty:

- ⦿ The interior of the product is disassembled without permission, or any part of it is replaced:
- ⦿ Damage caused by improper use and storage.
- ⦿ If the user causes product damage due to human factors, the company will charge the corresponding repair fee when repairing.

The pictures or diagrams involved in this manual are for reference only. Please refer to the actual product in the end. Any changes in the content are subject to change without prior notice.